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COMPARISON OF SINGLE SWITCHED CASCADED CONVERTER AND BOOST CONVERTER IN OPTIMIZING THE USE OF SOLAR PANELS

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ABSTRACT

The world's need for energy is growing at an alarming rate. To make the most use of the energy that is currently accessible on Earth, an emphasis on renewable energy sources is being applied globally. As is well known, solar cells' maximum output power rises as light intensity does. Therefore, it is clear that the solar cell performs better at generating power the more intense the light is. The purpose of this work is to demonstrate when and how to select the kind of DC/DC power converter to be used in the optimization process of a standalone PV solar system, which is required to characterise the area's climatic conditions for the system implementation and take into account the partial shading effect on the Photovoltaic System (PVG). Additionally, using the direct coupling responses of the PVG, calculate the resistivity of the load that will be injected. We could plot the current-voltage (I-V) and power-voltage (P-V) characteristic, using the manufacturer data and determining the maximum power point (MPP), as a function of the area's weather conditions variations, while also observing the direct coupling response of the load adapted to the PVG, based on the MATLAB/Simulink software and the PVG data sheet selection. We can determine the type of DC/DC power converter to use in the production optimization process of a standalone PV solar system based on this observation. Thus, if the direct coupling voltage responses, we must employ a Boost converter type. Boost converter type, or both at once Buck-Boost converter type, if we need to increase and reduce the voltage, are higher than those of MPP replies.

KEYWORDS: *DC-DC Converter, Cascade Converter.*